

SAN FRANCISCO ESTUARY PROJECT

Land Use and Population

The 12 counties in the Bay and Delta will attract over one million new residents during the next two decades. As the region's human population has increased, so have land use practices that adversely affect the Estuary's water quality and biological resources. Without careful planning, the urbanization of rural lands will degrade valuable wetland habitat and increase pollution of Estuary waters. The San Francisco Estuary Project is working with public interest groups, elected officials and government agencies to promote environmentally sound land use planning in the Bay-Delta watershed.

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The Estuary

The San Francisco Bay and Delta combine to form the West coast's largest estuary. The Estuary conveys the waters of the Sacramento and San Joaquin Rivers into the Pacific Ocean. The Estuary encompasses roughly 1,600 square miles and drains over 40 percent of the state. Its Delta and watershed provide drinking water to 20 million Californians, and irrigation water to four million acres of farmland. The Estuary also hosts a rich diversity of aquatic life. Each year, two-thirds of the state's salmon pass through the Bay and Delta, as do nearly half of the waterfowl and shorebirds migrating along the Pacific Flyway. Finally, Estuary waters enable the nation's fourth largest metropolitan region to pursue shipping, farming, fishing, boating, recreation, commerce and other activities.

Land Use

The 12 Bay-Delta counties (Alameda, Contra Costa, Marin, Napa, Sacramento, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma and Yolo) contain over one million acres of urban land. In addition, the region encompasses over 2.6 million acres of agricultural land and millions of acres of undeveloped areas such as forests, range lands, and wetlands. Until recently, almost all of the people, jobs, and housing were located on the flatlands immediately surrounding San Francisco and San Pablo Bays and in a few major centers along the principal rivers in the Delta area. During the last two decades, however, population growth has begun to shift away from these urban centers, following state and interstate highways ever farther inland. Urbanization of these once rural lands threatens the balance of the estuarine ecosystem by eliminating or modifying sensitive wetlands, altering stream courses, and watershed lands, and polluting the waters that flow into the Estuary.

History

1760s-1790 About 300,000 Native Americans lived in California until the 1760s, when Spanish missionaries arrived and developed grazing and subsistence farming land uses.

1790s-1847 New England traders arrived to ship furs from coastal California, home and abroad, using San Francisco as their main port. California's Spanish missions declined after Mexico's revolt from Spain, and American migration and trade increased.

1848-1860 Discovery of gold brought a flood of immigrants to the Sierra Nevada and Central Valley, many of whom later settled in San Francisco.

1860s-1900 As gold mining declined, Central Valley farming became California's economic base. Levees allowed conversion of almost 60 percent of Delta wetlands to agriculture.

1900s-1950 Urban uses consumed agricultural land, as California's industrial economy expanded. Increasing automobile ownership allowed commuting from growing residential suburbs. Responding to the State's inability to finance irrigation and flood control projects, the federal government built the Central Valley Project.

1950s-1975 With a huge spurt in population, suburbs grew rapidly after World War II. Many became centers of employment as well as housing, causing a shift in commute patterns. Diversion projects such as the State Water Project sought to satisfy increasing water demand.

1975-1996 Development expanded away from urban centers and into outlying areas. The Bay Area became a center for high-tech industry. Housing costs and congestion soared. Drought and competing water demands adversely affected the Estuary.



Future Land Use

Influences on Land Use

Private Sector Decisions: For real estate developers, businesses, industry and land owners, economic factors take precedence over growth management and environmental considerations. Developers, hoping to build and market projects quickly and at maximum profit, seek low-priced, adequately sized parcels; a receptive and predictable regulatory system; low development costs; and strong market demand. Locations meeting these criteria are often outside existing cities. Businesses decide where to locate their operations based on land and leasing costs, market proximity, availability of skilled labor, quality of transportation systems, and the area's "quality of life"—not necessarily on environmental concerns. Many land owners follow market conditions in deciding whether to sell their land for development.

Public Sector Decisions: City and county governments guide land development through their General Plans and zoning regulations. Local Agency Formation Commissions (LAFCOs) determine urban expansion and service limits, and control city and special district boundaries. Regional, state and federal agencies have less direct control over land use, but prepare plans for and regulate the effects of development on specific resources, such as wetlands and geographic areas like San Francisco Bay.

Taxes and Laws: Tax policies and laws affect the Estuary's land use patterns. Proposition 13, passed in 1978, greatly reduced local governments' property tax revenue, forcing them to rely more heavily on sales taxes, development fees, redevelopment funding, and land annexation, especially for commercial development. As a result, many local governments favor retail development, which generates sales tax revenues, over housing, which requires additional services. Proposition 4, passed in 1979, set a constitutional limit on government spending, leading to problems in financing construction and maintenance of roads, water, sewer and flood control systems.

Population Density

With a human population that has increased from about three million in 1950 to more than eight million today, the 12-county Bay-Delta area is the fifth most populous metropolitan area in the United States. It will remain one of the most urban areas in California. Six of the ten California counties with projected population densities of 100 people per square mile are located in the Bay and Delta area: Alameda, Contra Costa, Sacramento, San Francisco, San Mateo and Santa Clara. Three other counties (Marin, San Joaquin and Solano) will have a population density exceeding 50 people per square mile.

Even though this 12-county region accounts for only 6 percent of California's total land area, it will host about 25 percent of the state's residents by the year 2005.

Land Use Patterns

Continued population growth will require major decisions about where to locate new housing, commerce and industry, while minimizing impacts on the Estuary. Existing local government land use plans would allow suburban uses to continue to spread onto agricultural and other rural lands during the next two decades. Changes in land use plans would help to reduce the impacts of further growth on the Estuary, according to the Estuary Project's study titled *The Effects of Land Use Change and Intensification on the San Francisco Estuary*.

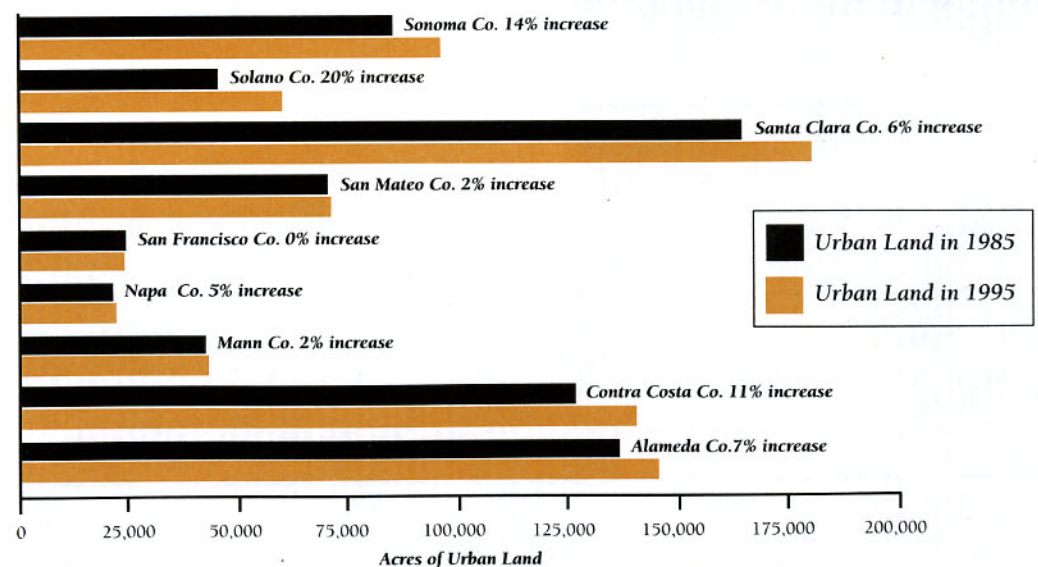
Under existing city and county General Plans, new housing (without mitigation), industry and commercial uses would consume another 331,530



acres by the year 2005. This amount of development would damage over 39,000 acres of wetlands in virtually every watershed in the 12 counties, and would also degrade 28,000 acres of streams and increase pollutant levels in the Estuary. Mitigation requirements for development could lessen the impact of the loss of wetlands. But the quality of wetlands replaced by mitigation is unknown. They may or may not provide adequate and functioning wetlands.

However, using a model based on factors such as topography and proximity of housing to jobs and transportation, the effects of suburban development on the Estuary could be reduced. In a model constructed and analyzed by the Estuary Project study, only about 80,000 acres would be converted to urban land uses by the year 2005 if new urban growth incentives and limitations were in place. This would affect 3,550 acres of wetlands and 10,000 acres of streams—a much smaller impact than expected from development allowed in existing General Plans. Under this alternative scenario smaller increases in Estuary pollution would also occur.

Urban Land 1985-1995



Environmental Concerns

Overview

Urban, agricultural and industrial expansion have destroyed thousands of acres of wildlife habitat and increased Estuary pollution. Continued urban expansion threatens to destroy and degrade additional valuable rural land and wetlands, and increase pollutant loads.

Wetland Loss

Agricultural and urban development have drastically reduced the size and productivity of the Estuary's wetlands. To support and protect new buildings and farms, wetlands are filled and diked to hold back tides and floods. The resulting patchwork of smaller habitats supports fewer wetland species. Even if urban uses do not eliminate wetlands, they often alter drainage patterns, disturbing the natural hydrology of wetland basins. Urban development can also impair the ability of wetlands to retain flood waters and trap and break down pollutants.

Stream Damage

Urban and agricultural land development can encroach on stream areas, where the combination of vegetation, soil and stream channels provides some of the Estuary's most important wildlife habitat. Urban development often removes vegetation that provides wildlife habitat, supplies the Estuary with nutrients, slows the flow of surface and ground water to streams, and traps sediment and pollutants before they reach the Estuary.

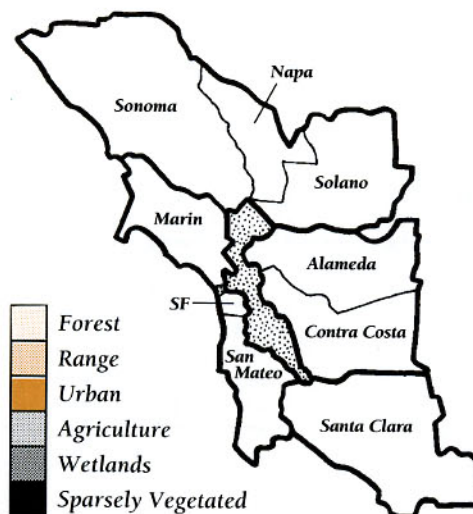
Water Pollution

Water running off the land into the Estuary picks up pollutants from different land uses along the way. Fertilizers and pesticides from household landscaping, golf courses and highway median strips contribute to polluted runoff. Urban development also increases automobile use, which is responsible for trace metals and petroleum hydrocarbons in road surface runoff and direct atmospheric deposition to surface waters. Industrial facilities and sewage treatment plants discharge treated wastewater into the Estuary. Illegal dumping of oil and other chemicals is another problem related to urban development. By some estimates, half of the used motor oil from households is dumped illegally on the ground, in storm drains or in landfills where, over time, it may find its way into the Estuary.

Erosion

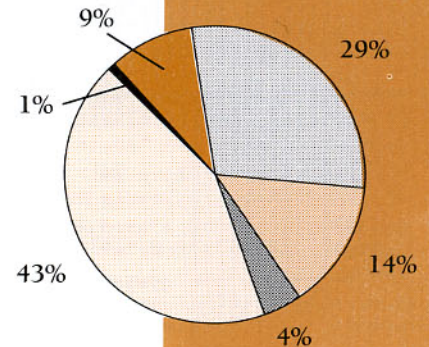
Land disturbance associated with construction grading for site preparation and poor farming practices accelerates soil erosion, which leads to increased levels of suspended sediments in surface water. Pavement and other impervious land surfaces created by urban development cause faster runoff and greater flooding; this results in more channel scouring and erosion.

1995 Bay Area Land Use Patterns



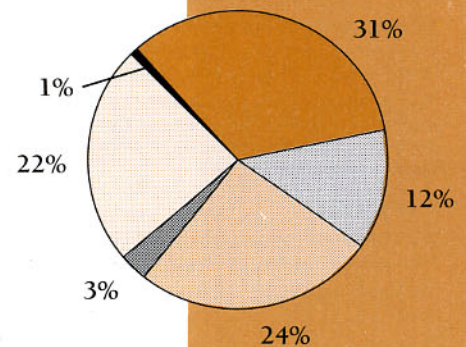
Sonoma, Napa and Solano Counties

(Total Acres: 2,027,580)



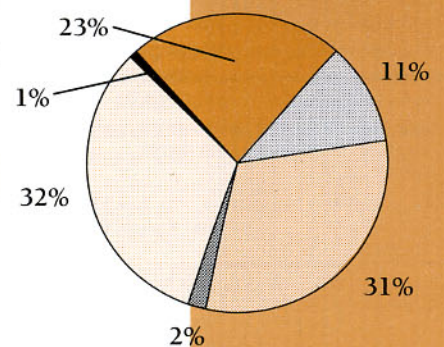
Alameda and Contra Costa Counties

(Total Acres: 934,391)



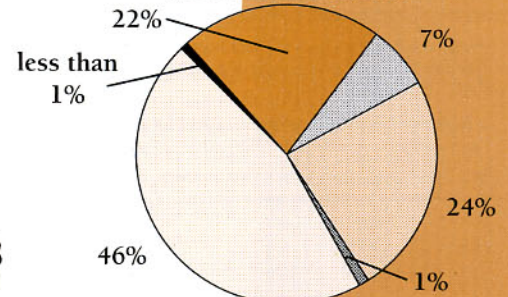
Marin, San Francisco and San Mateo Counties

(Total Acres: 647,889)



Santa Clara County

(Total Acres: 825,845)



Glossary

estuary: A partially enclosed body of water where river water meets and mixes with ocean water.

Local Agency Formation Commissions (LAFCOs): County organizations created by the State legislature to encourage orderly growth and formation and development of local agencies. LAFCOs control city and special district boundaries and approve or deny requests for city incorporations, district formations, and annexations of land.

General Plan: Document adopted by local governments to guide long-term policy for land use regulation, preservation and development. In California, zoning and development must be consistent with the community's General Plan, but not necessarily consistent with adjacent communities' General Plans.

runoff: Water from rain, melted snow or agricultural or landscape irrigation that flows over the land surface and discharges to surface waters.

wetland: Transitional areas between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

Current Issues

Resources

San Francisco Estuary Project Comprehensive Conservation and Management Plan

Status and Trends Reports on: Land Use and Population; Wetlands and Related Habitats in the San Francisco Estuary; Pollutants in the San Francisco Estuary; Dredging and Waterway Modification; Wildlife; Aquatic Resources.

The Effects of Land Use Change and Intensification on the San Francisco Estuary

State of the Estuary, 1992: A Report on the Conditions and Problems in the San Francisco Estuary

Quality Assurance in Environmental Analysis Applied to the San Francisco Estuary

An Introduction to the Ecology of the San Francisco Estuary

Information Sheets on: Wetlands; Agricultural Drainage; Pollution; Dredging; Water Usage; The Delta; The Estuary; Decisionmakers and Managers; Aquatic Organisms and Wildlife; and the CCMP.

Delta-Estuary, California's Inland Coast: A Public Trust Report, prepared for the California State Lands Commission, May 1991

Association of Bay Area Governments Improving Our Bay-Delta Estuary Through Local Plans and Programs: A Guidebook for Local Governments

Contacts

Bay Planning Coalition, 303 World Trade Center, San Francisco, CA 94111 (415)397-2293

California Environmental Trust, Hearst Bldg. Room 608, 53rd St., San Francisco, CA 94103

Center for Environmental Design Research, College of Environmental Design, 390 Wurster Hall, #1839, Univ. of California, Berkeley, CA 94720-1839 (510)642-2896

California Department of Fish & Game, 1416 9th St., 12th Floor, Sacramento, CA 95814 (916)653-7664

Central Valley Regional Water Quality Control Board, 3443 Routier Road, Suite A, Sacramento, CA 95827-3098 (916)255-3000

Greenbelt Alliance, 116 New Montgomery St., Suite 640, San Francisco, CA 94105 (415)543-4291

Home Builders Association, P.O. Box 5160, 200 Porter Dr., Suite 200, San Ramon, CA 94583 (510)820-7626

S.F. Bay Conservation and Development Commission, 30 Van Ness Ave., Suite 2011, San Francisco, CA 94102 (415)557-3686

S.F. Bay Regional Water Quality Control Board, 2101 Webster St., Suite 500, Oakland, CA 94612 (510)286-1255

Save S.F. Bay Association, 1736 Franklin St., 4th Floor, Oakland, CA 94612 (510)452-9261

State Lands Commission, 100 Howe Ave., Suite 100 South, Sacramento, CA 95825-8202 (916)574-1900

U.S. Army Corps of Engineers, 333 Market St., San Francisco, CA 94105-2197 (415)977-8618

U.S. Environmental Protection Agency, Region 9, 75 Hawthorne Street, San Francisco, CA 94105 (415)744-2125

U.S. Fish and Wildlife Service, 3310 El Camino Ave., Suite 130, Sacramento, CA 95821-6340 (916)979-2725

Protecting the Estuary

Carefully planned growth and land use change can provide opportunities to protect and enhance the Estuary. General plans can direct growth away from critical resources such as wetlands. Development can generate revenues for enhancement and acquisition of key resource areas. Local governments, as the primary regulators of land use, have the ability to reduce impacts from urban development. Of the many available strategies, perhaps the most effective would be a regional planning system that promotes Estuary protection as a factor in local land use decisions.

Regional Land Use Planning

City and county governments make land use planning decisions based on local objectives and usually do not coordinate these efforts with other agencies. This system offers little protection to a regional resource like the Estuary, and little guidance on important regional concerns such as growth management, jobs, housing, transportation, and quality of life. Recently proposed State legislation would strengthen state-wide and regional land use planning. Options include establishing a new state or regional planning agency, or merging existing regional bodies into a single, integrated regional agency. Local governments typically resist state and regional planning efforts, however, perceiving them as threats to local control. Both business and environmental interests have emerged as supporters of stronger regional planning.

Wetland and Stream Management

The adverse effects of land use change on the Estuary point to the need for improved management of wetlands and streams. Strategies include public education and involvement programs; establishment of regulatory boundaries and "buffer zones" around wetland and riparian areas; adoption of regulations that limit the types of land uses that may locate in these areas; strict regulation of permitted land uses through design standards and mitigation requirements; and acquisition and restoration of these lands by public or private entities, such as land trusts.

Land Trusts

Land trusts are one alternative to development threats to natural habitats. By purchasing property or acquiring easements to protect it from development, land trusts offer one of the few long-term options for preservation, restoration and enhancement of wildlife habitats, open space, recreation areas and agricultural land. Land trusts act in the public interest but with the flexibility of the private sector, usually taking action more quickly than a public agency can. Some land trusts in the Estuary region include the Marin County Agricultural Land Trust, Peninsula Open Space Trust, Solano County Farmlands and Open Space District, Napa and Sonoma Land Trusts, and the nationally-based Nature Conservancy and Trust for Public Land.



Stormwater and Runoff Pollution Control

The Clean Water Act now focuses attention on methods of reducing Estuary pollution from stormwater and runoff to help protect and restore water resources. National Pollutant Discharge Elimination System (NPDES) regulations require permits for stormwater discharges from urban runoff. The NPDES regulations also seek to control water pollution from construction activities, storm water runoff from urban areas, and illegal dumping and connections to sewer and drainage systems.

Estuary Project Goals

The San Francisco Estuary Projects's primary goal is to restore and maintain water quality and natural resources while promoting environmentally sound management of Bay and Delta waters.

The Project's **Comprehensive Conservation and Management Plan** proposes the following land use goals:

- Establish and implement land use and transportation patterns and practices that protect, enhance, and restore the Estuary's open waters, adjacent wetlands, adjacent essential uplands habitat, and tributary waterways.
- Adopt and utilize land use policies that provide incentives for more active participation by the private sector in cooperative efforts that protect and improve the Estuary.
- Coordinate and improve planning, regulatory, and development programs of local, regional, state, and federal agencies to improve the health of the Estuary.

The Estuary Project is now working cooperatively with agencies, environmentalists, business and the public to implement the Comprehensive Conservation Management Plan.

San Francisco Estuary Project

2101 Webster Street, Suite 500, Oakland, CA 94612 (510)286-0460